Absolute Position Encoder Requiring Less than One Encoding Track per Bit

ABSTRACT

An absolute encoder for measuring the position of a surface is disclosed. The encoder includes first and second encoding tracks. Each encoding track includes a code strip imaging system and an array of n photodetectors, where $n>1$. Each code strip imaging system generates an image from a code strip that is focused on the corresponding array of photodetectors. Each image includes alternating dark and light stripes. The width of the first code strip is chosen such that $nd_i=D_i$, where d_i is the width of the photodetectors in the array in the i^{th} encoding track and D_i is the width of the stripes in the code strip image in that track. The widths of the stripes and photodetectors are chosen such that $d_1=nd_2$.